

**CALFED Bay-Delta ERP Panel Review
Selection Panel Review Form**

Proposal Number: 130DA (revised)

Applicant Organizations: San Francisco Estuary Institute

Proposal Title: *A Pilot Program for Monitoring, Stakeholder Involvement, and Risk Communication relating to Mercury in Fish in the Bay-Delta Watershed*

Recommendation: Fund as is

Amount: \$4,323,004

Explanation of Rating:

Much of the Bay-Delta ecosystem (watersheds, streams, rivers, Delta, and Bay) contains large inventories of inorganic mercury from historic mining activities and other sources. Certain ecological restoration activities could increase production and concentrations of methylmercury in aquatic food webs supporting production of fish. Methylmercury readily bioaccumulates in exposed organisms and can biomagnify in food webs to concentrations in fish that are harmful to wildlife and humans consumers. Methylmercury is the dominant form of mercury in fish, and exposure of humans and aquatic wildlife to methylmercury results largely from the consumption of fish. For these reasons, the development of a program for monitoring mercury in fish, coupled with stakeholder input and risk communication concerning consumption of fish, was identified as a high priority in the mercury strategy for the Bay-Delta ecosystem.

This project would develop a program for monitoring mercury (present mostly as methylmercury) in fish in the Bay-Delta watershed, coupled to active stakeholder involvement and risk communication. Such a program is needed to assess spatiotemporal patterns in mercury contamination of fishery resources in the ecosystem, to examine the relation of such patterns to ecosystem restoration activities and other potential causal factors, and to provide a foundation for risk communication -- a proven approach for reducing exposure to methylmercury in humans who eat fish. This project will also develop "performance measures" to gauge methylmercury contamination of the watershed during ecosystem restoration and remediation of mercury source areas.

This revised proposal is based on a strong foundation of earlier work in the Bay-Delta watershed and elsewhere, and it has been substantially improved and strengthened relative to the prior version. As noted by the three reviewers, the critical comments and associated recommendations of the reviewers and the selection review panel concerning the prior version of this proposal were very satisfactorily addressed during preparation of the current proposal. The proposal received three favorable appraisals by reviewers, with two summary ratings of "excellent" and one summary rating of "very good." The team of investigators is knowledgeable, experienced, and possesses complimentary technical

strengths and multidisciplinary backgrounds. The project goals are ambitious, yet the probability of successful completion is considered to be very good.

Several aspects of the proposal's budget require more specificity and justification to satisfy contracting needs, as outlined in the administrative review. The selection panel notes that the total amount of funding requested is less than that in the previous version of the proposal, and that the technical reviewers concluded that the budget is reasonable for the magnitude of the effort proposed. . The Selection Panel recognizes that in developing a contract for the proposed work, the contracting agency will require additional information that may result in some cost savings.

The Selection Panel encourages the proponents, in forming the project's steering committee, to extend invitations to the Bay-Delta Authority's lead scientist (or his designee) and to a representative of the BDPAC Environmental Justice Subcommittee or the Bay-Delta Authority's Environmental Justice Program. In addition, the applicants are encouraged to consider the "additional comments" provided by reviewer #2 (particularly comments 1 and 2, which concern the determination of mercury in fish tissue and cross-calibration of analytical results among participating laboratories).

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CALFED Ecosystem Restoration Program External Review Form

Proposal Title: A Pilot Regional Monitoring Program for Mercury in Fish in the Bay-Delta

Review:

- 1. Goals. Are the project's goals and objectives clearly stated and internally consistent? What ecosystem restoration benefits will it provide?**

As was the case for the original project proposals, I think that the goals and objectives of the project are clearly stated and internally consistent. This is a large and ambitious project that now has fewer objectives. However, this seems to be mainly due to the deletion of some points that are clearly still objectives of the project because they are still a part of the project description. An important part of the project continues to be to develop methods to test the effects of ecosystem restoration projects. The project continues to be formulated as a pilot project and many of the objectives are to set up the protocols and administrative structures that will be put in place for the longer term monitoring activities. A Steering Committee will coordinate activities with other projects in the area, will advise on sampling design and will provide input on public information. In addition, experts on fish monitoring and risk communication will supplement the expertise on the Steering Committee.

The project is still not aimed directly at providing ecosystem restoration benefits. As for the previous proposal, a component of the project will develop methodology for evaluating the effect of various ecosystem restoration projects on Hg cycling. The link to these restoration projects has been strengthened compared to that outlined in the previous project proposal. The link to ongoing and completed Hg-related research projects in the area has also been strengthened in the revised proposal.

- 2. Approach. Is the approach well designed and appropriate for the project's objectives? Is it justified by prior site studies or other information documented in the proposal? If additional information is needed to adequately plan and design the project, does the proposal include adequate provisions for obtaining it during the project's design and environmental assessment? If not, what additional information should be gathered?**

As for the previous version of the proposal, the approach appears to be well designed and appropriate for the project's objectives. A major aspect of the project is in fact to design the approach to the problem, based on input from the Steering Committee and experts on sampling design and statistical analysis. The proposal has been strengthened, as compared to the previous version, in the area of expertise on statistical design and analysis. Also, the proposal has been strengthened by more fully building on existing information on Hg in the study area.

3. **Feasibility.** Is the approach fully documented and technically feasible? Is the scale of the project consistent with its objectives? Does it reflect “best practices” for this type of project? If not, how should the project be revised to reflect “best practices”? Is it likely to attain the ecosystem restoration objectives it seeks?

As in the previous version of the proposal, the approach is not fully documented, but the process of developing the methods, sampling strategies, sampling sites, and sampling frequencies is provided. The project appears to be technically feasible. The scale of the project is still consistent with its objectives and benefits.

4. **Capabilities.** What is the applicants’ track record in terms of past projects? Is the project team qualified to efficiently and effectively implement the project? Does the proposal describe how additional expertise and other support necessary to successfully accomplish the project will be obtained? If not, what additional expertise or support is needed?

The applicants are the same as in the previous proposal, who were judged to have excellent qualifications and good performance with existing projects. The project team has been strengthened by the addition of expertise in sampling design and statistical analysis.

5. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

The budget is reasonable for the scale of the work proposed. The total budget has been trimmed somewhat from the original estimates, making it better value than in the previous proposal.

Additional comments: The revised proposal is not fundamentally different from the previous version. The objectives have been streamlined, the budget has been reduced somewhat, the technical team has been strengthened, and the review of existing information and projects has been strengthened. But, the overall process outlined is similar. But, I felt in my earlier review that the proposal was excellent and that the approach proposed was reasonable, and my view has not changed.

Please provide an overall evaluation summary rating: Excellent: outstanding in all respects; Good: quality but some deficiencies; Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
Excellent XXX	The importance of monitoring Hg in fish and food chains in the Bay-Delta area has not diminished since the review of the original proposal. Hg is an important contaminant in the area and assessing the impact of habitat rehabilitation projects on Hg cycling should be a primary concern. Also, the determination of Hg levels in fish populations consumed by people and wildlife, and the communication of this information to human consumers, is also seen as an essential activity. This project cannot be the definitive end point of monitoring, rather it should be seen as the beginning of a longer-term process that should include monitoring over a longer time scale. The value of beginning monitoring in 2004 is still stressed, however this may now be difficult, given the timing of the review of the revised proposal.
Good	
Poor	

CALFED Ecosystem Restoration Program External Review Form

Proposal Title: A Pilot Program for Monitoring, Stakeholder Involvement, and Risk Communication Relating to Mercury in Fish in the Bay-Delta Watershed.

Review:

1. **Goals.** Are the project's goals and objectives clearly stated and internally consistent? What ecosystem restoration benefits will it provide?

The project's **goals** are stated in a list of three. The first and third goals have been modified slightly from the last version of this proposal. The last version was returned to the proposers with the suggestion that they make modifications and re-apply. The modifications in the goals are in keeping with the Selection Panel Review comments, as are other changes in the proposal. Overall, I see the modifications as responsive in an appropriate way to the Selection Panel Review comments, which are in themselves a fair and insightful summary of the peer review of the last version of this proposal.

The first goal has been slightly modified to clarify that the goal of reducing exposure to methylmercury-contaminated fish is to be accomplished through risk communication, whereas the means was unstated in the last draft. This is an important and focusing clarification, in that one might have thought that methylmercury exposure could conceivably be reduced through modification of wetland restoration plans. There is an underlying concern that wetland restoration is predicted to exacerbate fish contamination even as other efforts work to reduce the the total amount of mercury available for methylation. Realistically, any three-year project could only reduce exposure by developing effective risk communication, a major component of this proposal. Three years is not enough time to reduce exposure in any other manner.

The second goal is unchanged, which is to develop "performance measures" to gauge methylmercury contamination of the watershed during restoration and remediation. This goal is necessary for the goal of protecting human health (goal 1).

The third goal, to "Establish an organizational and technical foundation for cost-effective, scientifically defensible monitoring of mercury in the watershed..." has basically been modified by replacing "adaptive, state-of-the-science regional monitoring" with the following clause: "... that meets the identified needs of end users and is coordinated with related science and management efforts." This change is useful in that it makes the monitoring useful for defined purposes rather than seeming like monitoring is an end in itself.

The **Objectives** have been trimmed from 11 to 4, in keeping with the panel suggestion. This change is appropriate, and has been done well. In reading the new proposal, it appears that most of the original 11 objectives will still be pursued, but reducing the number to 4 identifies the larger objectives. Most of the unlisted objectives are necessary

means to ends. One significant change is the deletion of objective 11, “Develop and test protocols for evaluating the impacts of restoration, remediation, and landscape manipulation.” The new version narrative does not discuss this objective, although the executive summary does state (p. 8) “The pilot monitoring program will include... development of protocols and monitoring of selected restoration and remediation sites.” Coordination potential with restoration activities is listed in Table 2 and Attachment 3. I have trouble, however, determining exactly the nature of this coordination. It may consist of this project collecting interannual and benchmark data pertinent to a particular restoration effort.

What ecosystem restoration benefits will it provide?

If restoration efforts proceed without the collection of mercury monitoring data, there will be a large hole in our understanding of the benefits of ecosystem restoration. Given existing assumptions, people will assume the worst – that wetland restoration makes fish much more contaminated. This is unlikely to be universally true, and the exceptions will tell us a great deal about how the ecosystems work, and what management options exist for reducing mercury exposure to humans and wildlife. This program will provide a critical feature of restoration – knowledge, and will also eliminate the fear of the unknown. People tend to assume the worst, in the absence of information. This project will provide the information, and therefore provide the vocabulary for a calm discussion of the alternatives.

2. **Approach.** Is the approach well designed and appropriate for the project’s objectives? Is it justified by prior site studies or other information documented in the proposal? If additional information is needed to adequately plan and design the project, does the proposal include adequate provisions for obtaining it during the project’s design and environmental assessment? If not, what additional information should be gathered?

Approach: This version of the proposal includes extensive efforts to document prior site studies and other existing information. I do make a few constructive suggestions in the “Additional Comments” section, below, in an effort to buttress the existing approach, which is quite good.

3. **Feasibility.** Is the approach fully documented and technically feasible? Is the scale of the project consistent with its objectives? Does it reflect “best practices” for this type of project? If not, how should the project be revised to reflect “best practices”? Is it likely to attain the ecosystem restoration objectives it seeks?

Feasibility: This is a feasible project, but note that it is properly labeled a “Pilot Program...”. By its nature, it will encounter problems that need to be resolved. Regarding “best practices,” it is not entirely clear what “best practices” are for mercury monitoring. In “Additional Comments” I make a few suggestions, such as quantifying the bias among labs, and quantifying the relationship among species. These suggestions

may or may not be “best practice” but they should be considered for practicality by these investigators. Overall, this project will be as good as any similar effort, if the investigators are thoughtful and open to new ideas, and I think they are. I don’t think that this project in itself will attain ecosystem restoration, but I think it can achieve the three goals that it presents.

4. **Capabilities.** What is the applicants’ track record in terms of past projects? Is the project team qualified to efficiently and effectively implement the project? Does the proposal describe how additional expertise and other support necessary to successfully accomplish the project will be obtained? If not, what additional expertise or support is needed?

The project team has the experience to implement this project. The addition of the two statisticians, in accordance to the suggestion of the panel review, has strengthened the likelihood of success. The use of outside reviewers will help this competent group to be thoughtful and to take the time to adjust during the project.

5. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

The budget has been reduced from the last proposal, yet the essence of the work has been retained. It is a very large budget, but also a very large body of work. I think there is reason to think that this pilot project will identify the most cost-effective way to continue monitoring, so that the essential story about mercury bioaccumulation in the Bay-Delta Watershed can be obtained in an ongoing manner.

Additional comments:

1) I notice that the footnote for the budget of Task 2, “TEMPORAL TREND MONITORING” includes \$35,000 for the purchase of a Milestone DMA-80 Mercury Analyzer. We utilize one of these instruments for fish tissue analysis, and find it to be an excellent alternative to traditional wet chemical methods. In fact, the variance of our measurements has decreased since we adopted the use of this instrument. However, nowhere else in the proposal do I see reference to this instrument, and Attachment 6, “SAMPLING AND ANALYTICAL METHODS”, states that fish samples will be analyzed using a Perkin Elmer Flow Injection Mercury System. What is the purpose for the purchase of the DMA-80? There appear to be several different labs analyzing fish, but it is difficult to sort out which fish collected under which monitoring program will be analyzed where.

2) In a related issue, Attachment 6 states that 5% of samples will be analyzed by an independent lab. It is more important that the different labs participating in this study cross-calibrate and establish quantitative conversion factors between labs. This is different than the usual QA procedure, which would hold that if two labs are within x% of each other, then each lab is satisfactory—*and doesn’t need to modify or correct any data*. What is more important in spatial or time trend monitoring is to quantify the bias among labs involved in the study and use that quantification to convert numbers to a

common standard. If one lab is using the DMA-80 and another the Perkin Elmer equipment, it would not be surprising if there were consistent differences between labs, which can and ought to be accounted for.

The common standard needs to be explicitly defined and reproducible over time. It may be useful to make and archive a relatively large amount of benchmark fish tissue *from this ecosystem* that is available for years to come so that inevitable questions about the reality of apparent change over time can be unambiguously addressed. Otherwise, nay-sayers will attribute apparent trends to drift in analytical accuracy and change in analytical procedure (e.g. DMA vs Perkin Elmer).

3) The proposal mentions several times that that sampling the entire spectrum of sport fish and lower trophic level fish species will provide valuable information on mercury concentrations: For instance, on how concentrations in the primary indicator species can “generally be extrapolated to other species” (p. 9). Or, “An additional species [other than largemouth bass] will also be collected to facilitate spatial comparisons with sties where largemouth are not present” (p. 15). These information uses seem rather vague and may be lost if not explicitly pursued. Given the goal of constructing maps of the mercury bioaccumulation in fish throughout the watershed (p. 15), I suggest that this project formalize this use of multiple fish species, and quantify the relationships between the mercury concentrations in different fish and prey species. If the relationships are quantified, then the relative mercury bioaccumulation across the study area can be mapped by converting all biotic mercury concentrations to a common metric, say a 14 inch largemouth bass, even when largemouth are not present. USGS researcher Steve Wenthe has spent years developing appropriate protocols, which this project could investigate and utilize:

<http://www.epa.gov/waterscience/fish/forum/2004/presentations/tuesday/wente.pdf>

It is difficult to map the degree of mercury bioaccumulation unless fish concentrations are converted to a common species and length. If mercury water concentrations were measured (either methyl or total), the bioaccumulation factor could be mapped, by modifying the protocol.

Another application of Wenthe’s protocols would be the generation of fish consumption advice for species and sizes that did not happen to get caught at a particular sampling site.

Please provide an overall evaluation summary rating: Excellent: outstanding in all respects; Good: quality but some deficiencies; Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
Excellent x	The investigators have made thoughtful changes in their proposal in response to the comments of the review panel report. There are a large number of options for the pursuit of this necessary task (monitoring fish for trends and in relation to wetland restoration), and the development of a pilot program is a necessary step. The pilot program will try a lot of the options, and presumably report that some work better than others and are more cost-effective than others. The risk communication portion of the project will also be a learning experience – it is not possible to know prior to a pilot project what the eventual optimal approach will be. So, this project is not perfect, but I don't think anyone can know how to make it perfect until it is carried out. It appears to me that it is ready to proceed.
Good	
Poor	

CALFED Ecosystem Restoration Program External Review Form

Proposal Title: A PILOT PROGRAM FOR MONITORING, STAKEHOLDER INVOLVEMENT, AND RISK COMMUNICATION RELATING TO MERCURY IN FISH IN THE BAY-DELTA WATERSHED

Review:

6. **Goals.** Are the project's goals and objectives clearly stated and internally consistent? What ecosystem restoration benefits will it provide?

The project goals are well-described and consistent throughout the proposal. These are quite lofty goals for a three-year project. The authors describe a study that involves a stakeholder-influenced monitoring program, analyses and outreach with respect to their analyses and for communication of risk to the general public. It is an ambitious project for the given funding cycle.

The project is not an ecosystem restoration project, but rather an assessment of ecosystem health. Successful communication of results and associated risks may lead to a greater public awareness and more support for ecosystem restoration efforts in the Bay-Delta region.

7. **Approach.** Is the approach well designed and appropriate for the project's objectives? Is it justified by prior site studies or other information documented in the proposal? If additional information is needed to adequately plan and design the project, does the proposal include adequate provisions for obtaining it during the project's design and environmental assessment? If not, what additional information should be gathered?

The authors rely heavily on the Wiener et al. (2003) report to frame the major questions of their project. They present results of fish monitoring from 1999 and 2000 to support their approach. They spend an extensive amount of the proposal describing needs assessments and stakeholder advisory groups to help frame a major part of their monitoring efforts. While I commend the PIs for involving advisory groups, it probably would have been more effective to create at least a tiered structure for key monitoring sites in the study area. There are many references made to other ongoing efforts in the area, yet there was not a discussion of how the selection of at least a few master sites might be coordinated with other studies. While I am convinced that there is a need for establishing a sentinel species or two for monitoring, an "enhanced monitoring" might be co-located at a site from Table 2 where these analyses may supplement process work. On page 24, the authors suggest that the current proposal "advance(s) process understanding" yet without a link to a process-level study, this work may not address that particular priority. It would have definitely been a stronger proposal had the authors presented a "straw man" sampling approach where key sites were identified based

on interpretation of preliminary data and collaborative work with other process-related studies.

8. **Feasibility.** Is the approach fully documented and technically feasible? Is the scale of the project consistent with its objectives? Does it reflect “best practices” for this type of project? If not, how should the project be revised to reflect “best practices”? Is it likely to attain the ecosystem restoration objectives it seeks?

This is an ambitious project for the short timeframe of the study period. I am concerned that the need for steering committee’s input for sampling design and QA. At this point, the PI’s should be confident that they have a sound monitoring plan for at least a subset of sites. It may be difficult to balance the design of a truly scientific, statistically-based monitoring regime with one that might be influenced by local groups with specific needs. This type of iterative basis may weaken the monitoring design.

On the other hand, the use advisory groups and stakeholder on the outreach side is a very strong part of this proposal. This is one of the few proposals that I have reviewed for CBDA that contains a well-developed outreach component. I find it difficult to believe that EHIB has not undertaken this effort prior to this proposal. I suggest partnering with California Sea Grant extension staff, who have well-established working relationships with stakeholders in the area. They are seen as “unbiased brokers” of scientific information and may help strengthen outreach efforts.

9. **Capabilities.** What is the applicants’ track record in terms of past projects? Is the project team qualified to efficiently and effectively implement the project? Does the proposal describe how additional expertise and other support necessary to successfully accomplish the project will be obtained? If not, what additional expertise or support is needed?

The background and expertise of the assembled staff appear to be well-suited for this effort. They have thought through the collection, analyses, statistical validation and interpretation of results and aligned staff to take on the complexities of these efforts. Additional partnering with CBO’s might allow more comprehensive outreach and additional funding to those types of groups may be warranted toward the latter year of this project, rather than from a central agency.

10. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

There is no doubt that this is an expensive project, but at the same time, a sound biotic monitoring study is essential for the overall CBDA mercury efforts. The PIs should involve students in as many phases of this project as possible. Outreach

opportunities on this project would provide excellent opportunities (balance) for those students who spend a significant amount of time in field sampling and laboratory efforts.

Additional comments:

Please provide an overall evaluation summary rating: Excellent: outstanding in all respects; Good: quality but some deficiencies; Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
Excellent	This proposal is rated below excellent because I feel that the PIs could have done a better job establishing a set of prioritized sampling sites based on interpretation of the large amount of data that already exists and the ability to co-locate with studies that have been established or are in the initial stages of development. This would ensure that the project would “hit the ground running” and be revised based on advisory committee/stakeholder input. The comprehensive approach that involves monitoring, analysis, valid interpretation and (especially) outreach is commendable.
Very Good X	
Poor	

CALFED Bay-Delta Directed Action
Administrative Review
Budget Evaluation

Proposal number: 130DA -- revised

Proposal title: *A Pilot Program for Monitoring, Stakeholder Involvement, and Risk Communication Relating to Mercury in Fish in the Bay-Delta Watershed*

1. Does the proposal include a detailed budget for each year of requested support?

Yes, although some details are missing.

2. Does the proposal include a detailed budget for each task identified?

Yes, although there needs to be some clarification, especially for Task 1

3. Does the proposal clearly state the type of expenses encompassed in indirect rates or overhead costs?

No

If no, please explain: Typically, budgets will break out costs into salary, benefits, other categories of direct costs, and then indirect costs. In this proposal, the SFEI budget lumps together salaries, benefits, and other costs into one category called "labor costs". The proposal explains the salary (\$18-\$45 per hour) and benefit rate (18%) but does not include a breakdown of the other expenses in the "labor cost" which average around \$90/ hour. There needs to be a more clear explanation of what goes into the "labor cost" category and how the totals were calculated for each task. In the subcontracts, indirect costs are 20% for SJSUF, 26% for UCD, and 19.6% for DHS-EHIB. All of these indirect rates will require additional justification in order to be approved by Dept. of General Services.

4. Are appropriate project management costs clearly identified? No

If no, please explain: Task 1 is not completely described and it is difficult to determine how the costs add up. The proposal lists 5 subtasks, but only two of the subtasks are described with any detail (Narrative pages 5-8). Page 21 of the proposal lists \$150,000 for a review panel and \$72,000 for statistical consultation that will be included in the subcontracts. This adds up to \$222,000, but the amounts for subcontracts in the budget are \$337,821. It is unclear what the additional funds in the subcontract category are for. It is not clear how the \$222,000 in subcontracts relates

to the Task 1 budget breakdown on page 28. There is not explanation of how these subcontracts will relate to the subtasks for task 1.

5. Do the total funds requested (Form I, Question 17A) equal the combined total annual costs in the budget summary?

Within \$1

6. Does the budget justification adequately explain major expenses?

No

If no, please explain: Areas that need more explanation:

- Calculation and explanation of “labor costs” for SFEI budget (approx \$90/hour)
- More explanation of Task 1, including explanation and breakdown of costs in the subtasks, and explanation of subcontracts
- More explanation and justification of travel costs, especially for SJSUF subcontracts (collectively \$61,120 in the subcontracts)
- More detailed breakdown of equipment purchases in the subcontracts (collectively \$100,000 in subcontracts). Equipment purchase over \$5000 requires 3 bids, per state regulations. Equipment will be returned to the state upon completion of the contract (also state regulations).
- More detailed breakdown of supplies in the subcontracts, especially for SJSUF subcontracts (collectively \$88,319)
- Need much more justification of the sub-subcontracts – who is the subcontractor, how were they selected or rates determined, purpose of the subcontract. Also, need budget breakdown and explanation of Gary Ichikawa as subcontractor – is his travel expenses included in the subcontract? What work is he performing? Why does he require \$34,000 per year in travel expenses?

7. Are there other budget issues that warrant consideration? Yes

If yes, please explain:

- \$150,000 for the review panel seems like a lot to pay- especially if this project will also be participating the overall annual mercury review
- Computer equipment (\$6000 in SFEI contract) is considered equipment not supplies

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